

**REMARKS**

The present claims relate to a process for producing cumene or a process for producing propylene oxide.

***Amendment summary***

Upon entry of this Amendment, Claims 1-6 will be pending.

The specification is amended to insert a reference to the parent PCT application and priority documents and also to correct an error that resulted from the translation from PCT/JP2003/016074.

Claim 6 is amended for the sake of clarity.

No new matter is added by this Amendment, and Applicants respectfully submit that entry of this Amendment is proper.

***Status of the Claims***

Claims 1-6 have been rejected under 35 U.S.C. § 112 for allegedly being indefinite. Claims 1-5 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Becker et al. (U.S. Patent No. 3,526,674) (hereinafter “Becker”) in view of Mahendroo (U.S. Patent No. 4,257,877). Claim 6 has been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Tsuji et al. (WO 2001070710 as evidenced by U.S. Publication No. 2003/0032822) (hereinafter “Tsuji”) in view of Becker and Mahendroo. Finally, Claim 6 has

been rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over Claims 1-2 of Tsuji in view of Becker and Mahendroo.

***Response to rejection of Claims 1-6 under 35 U.S.C. § 112***

With respect to the rejection of Claim 1 for allegedly being indefinite for including the allegedly repetitive word “produced,” Applicants respectfully submit that the claim is clear and definite. Page 1, line 22 to page 2, line 3 of the specification support the inclusion of this word in the claim, noting that the water that is being referred to is produced during the dehydration of the cumyl alcohol.

With respect to the rejection of Claim 6 for allegedly being indefinite because it was allegedly unclear what was required for the method steps, Applicants respectfully submit that Claim 6 is clear and definite. Claim 6 recites that the dehydration step and the hydrogenation step are carried out by a method according to any one of claims 1 to 5.

In view of the above, Applicants respectfully submit that Claims 1-6 are clear and definite, and request reconsideration and withdrawal of the § 112 rejection of Claims 1-6.

***Response to rejection of Claims 1-5 under 35 U.S.C. § 103 based on the combined teachings of Becker and Mahendroo***

Independent Claim 1 recites a process for producing cumene which comprises supplying cumyl alcohol and hydrogen to a dehydration catalyst to obtain a mixture containing  $\alpha$ -methyl styrene, water, and hydrogen. The mixture is supplied to a hydrogenation catalyst. Thus, the present claims recite that the dehydration of cumyl alcohol is carried out in the presence of

hydrogen and a dehydration catalyst. The hydrogenation is then carried out by supplying the mixture of  $\alpha$ -methyl styrene, water, and hydrogen to a hydrogenation catalyst.

Becker discloses the dehydration of cumyl alcohol by using a dehydration catalyst. However, Becker does not disclose, teach, or even suggest the presence of hydrogen, which may react with the alcohol via a reduction reaction, in the reaction it discloses. Becker also contains no motivation for altering the process that it discloses by adding hydrogen to the process.

There is also no disclosure or suggestion within Mahendroo that water is used in the hydrogenation process therein, even though the present claims recite that water is present with the hydrogenation catalyst. Applicants further note that because Becker does not disclose a hydrogenation catalyst meeting the recitations of the present claims, there is no disclosure or teaching within Becker to remedy this deficiency within Mahendroo. Because there is no disclosure or suggestion of water being present with the hydrogenation catalyst within Mahendroo, and also because the Office Action contains no assertion that the presence of water with the hydrogenation catalyst within Mahendroo would be obvious, Applicants respectfully submit that this element of the claims is not present in or rendered obvious by the cited art.

In view of the above, Applicants respectfully submit that Claims 1-5 are not anticipated or rendered obvious by the combined teachings of Becker and Mahendroo. Applicants therefore respectfully request reconsideration and withdrawal of this § 103 rejection of Claims 1-5.

***Response to rejection of Claim 6 under 35 U.S.C. § 103 based on the combined teachings of Tsuji, Becker, and Mahendroo***

Claim 6 recites a process for producing propylene oxide, which comprises (1) an oxidation step of obtaining cumene hydroperoxide by oxidizing cumene; (2) an epoxidation step of obtaining propylene oxide and cumyl alcohol by reacting cumene hydroperoxide contained in a cumene solution with propylene in an excess amount in the presence of a epoxidation catalyst in a liquid phase; (3) a dehydration step of obtaining  $\alpha$ -methyl styrene by dehydrating cumyl alcohol obtained in the epoxidation step in the presence of a dehydration catalyst; (4) a hydrogenation step of hydrogenating  $\alpha$ -methyl styrene in the presence of a hydrogenation catalyst to convert into cumene; and (5) recycling it to the oxidation step as a raw material. The dehydration step and the hydrogenation step are carried out by a method according to any one of claims 1 to 5.

As an initial matter, Applicants respectfully submit that Claim 6 depends from any one of Claims 1 to 5, and Applicants have already discussed above those reasons why Claims 1-5 are not anticipated or rendered obvious by the cited art. Thus, Applicants respectfully submit that Claim 6 should also be allowed for at least those reasons.

The position set forth in the Office Action apparently relies upon Tsuji for its broad teachings of an oxidation step, an epoxidation step, and a hydrogenolysis step. The Office Action acknowledges that Tsuji does not teach the required step of dehydrating cumyl alcohol and then hydrogenating it, as recited in Claims 1-5.

Tsuji is silent regarding the production of cumene by dehydration of cumyl alcohol to produce  $\alpha$ -methyl styrene and the hydrogenation of  $\alpha$ -methyl styrene thereby obtained in order to produce cumene. As discussed above, neither Becker nor Mahendroo, alone or in combination, either disclose or teach the elements of Claims 1-5. Therefore, these references do not cure the deficiencies in Tsuji.

Therefore, Applicants respectfully submit that the present claims are neither anticipated by nor rendered obvious by this combination of references. Applicants accordingly respectfully request reconsideration and withdrawal of this § 103 rejection.

*Response to double patenting rejection of Claim 6 based upon Tsuji*

As an initial matter, it appears that the Examiner is citing U.S. Patent No. 6,639,086, which is the patent that matured from the patent application publication to Tsuji, cited above, as the basis for this rejection because it is not a provisional rejection, which it would have been had the Tsuji application publication been the basis for the rejection. If Applicants' representative is incorrect on this point, it is respectfully requested that the Examiner point out the correct basis for this double patenting rejection.

The '086 patent's claims, as correctly noted by the Examiner, do not include the dehydration and hydrogenation steps of Claim 6. Applicants respectfully submit that it is improper to rely upon the combined teachings of Becker and Mahendroo to provide the missing elements (even if Becker and Mahendroo were to teach the missing elements, which they do not) because the double patenting rejection must be based upon the claims of the '086 patent. Therefore, Applicants respectfully request the withdrawal of this double patenting rejection.

In addition, Applicants also note that, as discussed above, Becker and Mahendroo do not teach the claim elements missing from the '086 patent. Therefore, even were the teachings of Becker and Mahendroo combined with the claims of the '086 patent, they would not support a double patenting rejection because all elements of the claims are not present.

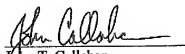
Applicants accordingly respectfully request the reconsideration and withdrawal of this double patenting rejection of Claim 6.

*Conclusion*

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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